

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 2 of 13

Attorney's Docket No.: 02894-609001 / 06410-
PT12/co-

Amendments to the Specification:

Please replace the paragraph beginning at page 1, line 1 that was added by the preliminary amendment of November 26, 2003 with the following amended paragraph:

CROSS-REFERENCE TO RELATED APPLICATIONS

- This application is a continuation under 35 U.S.C. § 120 of PCT International Application No. PCT/EP01/02844, filed March 14, 2003 2001, the contents of which is incorporated by reference in its entirety.- -

Please replace the paragraph beginning at page 1, line 2 with the following amended paragraph:

This invention relates to a method for cleaning teeth by means of an electric dental cleaning device having coupled to its handle section various cleaning tools for the individual tooth cleaning of the users of the dental cleaning device. The present invention further relates to the handle section of an electric dental cleaning device, in particular toothbrush, which possesses a coupling section for the coupling of a variety of cleaning tools, a drive mechanism for driving the respective coupled cleaning tool, and a control device. The present invention ~~finally~~ also relates to the cleaning tools, particularly brush attachments, for such a handle section.

Please replace the paragraph beginning at page 1, line 10 with the following amended paragraph:

Dental cleaning devices such as electric toothbrushes or electric oral irrigators customarily have a grip or a handle section to which a variety of cleaning tools such as brush attachments are attachable, thus enabling several users to use the dental cleaning device with their own, user-related cleaning tools. Such electric toothbrushes are known, for example, from DE 19627752 A1 or EP 0624079 B1. To meet the users' wishes and requirements with regard to

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 3 of 13

Attorney's Docket No.: 02894-609001 / 06410-PT12/co-

the cleaning of their teeth, the respective user has the possibility of individually adjusting dental cleaning parameters such as, for example, the strength of the water jet of oral irrigators or the speed of the brush attachments of electric toothbrushes.

Please replace the paragraph beginning at page 1, line 19 with the following amended paragraph:

From DE 299 15 858 U1 a dental cleaning device is known in which each of the different toothbrushes can be inserted only into its assigned receptacle in a console. This then starts the program provided for this particular toothbrush. Particularly ~~However~~, children find it ~~however~~ particularly difficult to locate the individual opening for insertion of their personal toothbrush and for mating engagement of the plug. Furthermore, this console involves high complexity of manufacture, considering that it requires the provision of a plurality of different receptacles and each of the toothbrushes has a different plug assigned to its own receptacle.

Please replace the paragraph beginning at page 2, line 6 with the following amended paragraph:

It is ~~therefore~~ an object of the present invention to provide an improved method for cleaning teeth, an improved handle section of an electric dental cleaning device and improved cleaning tools ~~therefore, which that~~ further develop the cleaning of teeth relative to the prior art and afford further advantages. In particular, the invention aims to further improve adaptation to individual users as well as user friendliness.

Please replace the paragraph beginning at page 2, line 11 with the following amended paragraph:

With regard to the method aspects, according to the invention this object is substantially accomplished in a tooth cleaning method of the type initially referred to in that a coding provided on the respective cleaning tool used is detected by the handle section preferably automatically and that, in dependence, the detected coding, the handle section controls dental cleaning

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 4 of 13

Attorney's Docket No.: 02894-609001 / 06410-PT12/co-

parameters preferably automatically and/or detects user-specific dental cleaning data preferably automatically. ~~Preferred embodiments of the invention are the subject matter of the subclaims.~~

Please replace the paragraph beginning at page 2, line 18 with the following amended paragraph:

With regard to the device aspects, according to the invention the object referred to is substantially accomplished in a handle section of an electric dental cleaning device of the type initially referred to in that the handle section possesses a coding detection device to detect an individual coding of the particular cleaning tool attached to the handle section, as well as a control device for the control of at least one function of the dental cleaning device in response to the detected coding. With regard to the cleaning tool of the type initially referred to, the object is accomplished in that it possesses a magnetic, electrical, capacitive, electromagnetic and/or mechanical coding device or a combination of such coding devices. ~~Preferred embodiments of the invention regarding the device are likewise the subject matter of dependent claims.~~

Please replace the paragraph beginning at page 5, line 3 with the following amended paragraph:

Preferably the handle section may include a movable or deformable sensing element ~~which~~ that is moved or deformed by the mechanical coding of the cleaning tool as the latter is being seated onto the handle section. Depending on the coding, the sensing element is moved or deformed by a predetermined amount or in a predetermined direction. The sensing element produces a signal responsive to the movement or deformation so that the coding can be detected. The sensing element may also be configured in such manner that it senses a force that the coding exerts as the cleaning tool is being seated onto the handle section. This can be accomplished, for example, by a piezoelectric design of the sensing element in which the sensing element is active itself to deliver a signal. To obtain a particularly simple configuration the sensing element may be constructed as a preferably electromechanical contact member. This member, upon being

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 5 of 13

Attorney's Docket No.: 02894-609001 / 06410-
PT12/co-

correspondingly deformed or moved by the coding of the cleaning tool, then opens or preferably closes one or several contacts so that a corresponding signal is produced.

Please replace the paragraph beginning at page 5, line 22 with the following amended paragraph:

The sensing element, ~~or the~~ sensing elements may be arranged so as to be freely accessible. In this arrangement the sensing element may be brought into operative association directly with a corresponding coding element of the cleaning tool. In an advantageous embodiment of the invention the sensing element is indirectly actuatable. The sensing element may be disposed in the interior of a housing of the handle section which may have a deformable portion, for example in the form of a soft plastic portion, through which the sensing element can be actuated. This enables a sealed, ~~in particular~~ fluid-tight construction of the handle section ~~to be obtained~~.

Please replace the paragraph beginning at page 7, line 18 with the following amended paragraph:

According to a further aspect of the invention the handle section may include a signal receiver or reacting member for receiving a coded signal from the cleaning tool. The handle section may also possess a signal transmitter or acting member emitting an interrogation or activation signal to the cleaning tool ~~which~~ that responds by sending the coded signal back. The emission of the coded signal by the cleaning tool may take place actively by a corresponding signal transmitter. The possibility also exists for passive reflection to take place on the cleaning tool, which produces a corresponding coding of the signal.

Please replace the paragraph beginning at page 7, line 26 with the following amended paragraph:

The coding of the cleaning tools and the corresponding detection of such coding may be implemented in a further variety of ways. According to a preferred embodiment of the invention

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 6 of 13

Attorney's Docket No.: 02894-609001 / 06410-
PT12/co-

provision is made for a magnetic sensor that detects a magnetic coding of the respective cleaning tool attached to the handle section. The magnetic coding of the cleaning tool may take place by introducing an individually different number of magnetic particles as acting member into a portion of the cleaning tool. The magnetic sensor may be of different configurations. According to a preferred embodiment of the invention the handle section includes as reacting member a Hall sensor that provides an electrical signal corresponding to the magnetic coding of the respective cleaning tool. According to a further preferred embodiment of the invention the handle section may include an LC oscillator ~~which~~ that is detuned by the magnetic coding of the attached cleaning tool, thus supplying different frequencies assignable to the individual users.

Please replace the paragraph beginning at page 8, line 8 with the following amended paragraph:

Another advantageous embodiment of the invention resides in the provision of reed contacts on the handle section ~~which~~ that are actuated individually when the cleaning tools are attached to the handle section. Depending on the combination of contacts actuated, a specific user can be identified. In accordance with an advantageous embodiment of the invention provision may be made for an optical sensor for detecting an optical coding of the respective cleaning tool attached to the handle section. As optical coding a color code may be provided on the cleaning tool ~~which~~ that is identified by a color sensor.

Please replace the paragraph beginning at page 10, line 5 with the following amended paragraph:

In summary, the present invention ~~provides an~~ relates to an electromotive toothbrush comprised of a handle section and one or more user-specific attachments as, for example, brush attachments or the like, with the handle section and the brush attachment fitted to the handle section communicating with each other. The brush sections or cleaning tools may be of various designs including, for example, a child's toothbrush with soft bristles, an adult's toothbrush with

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 7 of 13

Attorney's Docket No.: 02894-609001 / 06410-PT12/co-

hard bristles, an interproximal brush or the like, with each of these cleaning tools of different design for the intended application being assigned to a specific user. Hence a handle section usable by each user is provided, onto which user-specific cleaning tools of like or different design are plugged in order to care for or clean the respective user's teeth by means of the user-specific cleaning tool(s). The cleaning tools have an acting member or a coding communicating with a reacting member or a coding detection device in the handle section. Thus, by suitably designing the acting member(s) or coding device in the cleaning tool it is possible to inform the handle section, by way of communication between the coding device and the coding detection device, which user-specific cleaning tool, be it an interproximal cleaning tool, a toothbrush or some other cleaning tool, is currently plugged on the handle section. This possibility of detecting the user-specific or cleaning-tool-specific data of the particular cleaning tool attached to the handle section provides the prerequisite for the handle section to be able to operate the attached cleaning tool on a user- or cleaning-tool-specific basis. Thus it is possible to set, for example, the cleaning period, the cleaning speed or similar cleaning-specific parameters on a user- and cleaning-tool-specific basis by means of the handle section. Furthermore it is possible to detect user- or cleaning-tool-specific data in terms of the cleaning operation, which data can be stored, for example, in user- or cleaning-tool-specific memories of the handle section or can be indicated on a display. ~~The present invention not only protects a method of detecting the respective cleaning tool attached to the handle section of the electric toothbrush on a user- or cleaning-tool-specific basis, but also the handle section of the electromotive toothbrush as well as the related cleaning tool, with each of the last mentioned items being considered singularly.~~

Please replace the paragraph beginning at page 11, line 3 with the following amended paragraph:

Further objects, advantages, features and application possibilities of the present invention will become apparent from the subsequent description of several embodiments illustrated in the accompanying drawings. ~~It will be understood that any features described and/or represented by~~

Applicant : Alexander Hilscher et al
Serial No. : 10/662,237
Filed : September 15, 2003
Page : 8 of 13

Attorney's Docket No.: 02894-609001 / 06410-PT12/co-

~~illustration, whether used singularly or in any meaningful combination, form the subject matter of the present invention, irrespective of their summary in the claims or their back references.~~

Please replace the paragraph beginning at page 11, line 9 with the following amended paragraph:

~~In the drawings~~ DESCRIPTION OF DRAWINGS

Please add the following new paragraph after the paragraph ending at page 14, line 8:

Like reference symbols in the drawings indicate like elements.

Please add the following new paragraph after the paragraph ending at page 21, line 27:

A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, identification of a brush attachment may be accomplished by any number or combinations of electronics components, including capacitors, LC oscillators and other common components. Accordingly, other embodiments are within the scope of the following claims.

Please replace the abstract at page 28 with the following amended abstract:

~~The invention is directed to a~~ A method and a device for cleaning teeth wherein a variety of cleaning tools are coupled to a common handle section for the individual cleaning of teeth. It relates in particular to a handle section of an electric dental cleaning device, with a coupling section for coupling various cleaning tools thereto, as well as said cleaning tools. According to the invention the handle section detects a coding provided on the respective cleaning tool attached. In dependence upon the respective coding detected, various functions of the dental cleaning device are controlled.

(FIG. 4)